

## **Claims**

## 1. A display system for generating a visible pattern on a display surface

2 responsive to an audio frequency input signal, comprising:

means for emitting a visible beam of light along a predetermined beam

4 axis;

reflecting means interposed along the beam axis for reflecting the light

6 beam to form a reflected beam directed generally toward the display surface;

7 moving means including a pair of coils and a magnetizable means

8 associated with each said coil responsive to audio frequency input signals for movement  
9 of the reflecting means to generate a pattern on the display surface; and

mounting means for supporting said reflecting means proximate to said

11 pair of coils for movement of the reflecting means relative to said moving means.

1           2. The display system according to claim 1 wherein said reflecting means is  
2 movable in response to a sinusoidal input signal of an audio frequency to produce a  
3 pattern generated on the display surface which is substantially circular.

1           3. The display system according to claim 1, wherein one preferred audio

range is above about 200Hz and below about 500Hz.

1           4. The display system of claim 1 wherein the predetermined beam axis has  
2       an angle of variation of the visible beam of light is greater than zero degrees and less  
3       than ninety-degrees.

5. The display system of claim 1 wherein the coils are positioned on the

2 same side as the mirror.

1           6.     The display system of claim 1 wherein the coils are positioned on the  
2 reverse-side of the mirror.

1           7.     The display system according to claim 1 including means acoustically  
2 coupling said moving means to the output of an audio frequency source.

1           8.     The display system according to claim 1 wherein the visible beam of light  
2 is a laser beam.

1           9.     The display system according to claim 1, including connection means  
2 associated with said coils for connection to the audio input signal to transmit the audio  
3 input signal to said coils

1           10.    A laser beam projection apparatus comprising:

2               means for generating a laser beam for impingement onto a reflecting  
3 surface of a mirror; and

4               means responsive to a magnetic field associated with a pair of coils  
5 proximate to said mirror for movement of the mirror to change the direction of beams  
6 reflected from the mirror..

1           11.    The laser beam projection apparatus as claimed in claim 10 including at  
2 least one movable mirror movable in response to the magnetic field.

1           12.    The apparatus as claimed in claim 10 for use in combination with a light  
2 source and at least one audio signal for generating a visual display pattern responsive to  
3 the audio signal, comprising:

4                   said mirror being positioned for receiving a beam from the light source to  
5       form a reflected beam;

6                   a pair of coils and associated magnetic elements responsive to one of the  
7       at least one audio signal of said at least one audio signal; and

8                   means for coupling said coils and said mirror for imparting angular  
9       movement to the mirror for movement of the mirror in two dimensions normal to an  
10      axis, thereby directing the reflected beam to traverse a course defining the visual display  
11      pattern responsive to the audio signal.

1                 13.   The apparatus of claim 12, wherein the coupling means comprises  
2       spacing the mirror apart from the coils to permit movement of the mirror through an  
3       angular range in said two dimensions relative to the coils and thereby amplify the size of  
4       the display pattern and including means connecting one end of the mirror to maintain the  
5       mirror in a relationship to the coils for movement of the mirror relative to the coils.

1                 14.   The apparatus of claim 12 in which the angular range is greater than  
2       zero-degrees and less than ninety-degrees.

1                 15.   The apparatus of claim 12 wherein the mirror and the coils are positioned  
2       on a support plate mounted proximate to and spaced from said magnetic elements.

1                 16.   The apparatus of claim 10 wherein the coils when responsive to an input  
2       signal consisting of a regular, periodic waveform has a frequency other than the resonant  
3       frequency, the reflected beam traverses a substantially elliptical path.

1                 17.   The apparatus of claim 10 wherein the pair of coils is connected with  
2       opposite edges of the mirror.

1           18. The laser beam projector claimed in claim 16 including at least one coil  
2       associated with one end of said mirror for generating a magnetic field and at least  
3       another of said pair of coils associated with another end of said mirror to impact  
4       movement to said mirror responsive to audio inputs to said coils, such that the laser  
5       beam is deflected by movement of said mirror in response to the magnetic field  
6       generated by said coils.

1           19. A method of generating a visual display surface responsive to an audio  
2       frequency input signal comprising the steps of:

3                 directing a light beam along a predetermined beam axis towards a  
4       reflecting surface of a mirror;

5                 providing a pair of coils and associated magnetic element responsive to  
6       the audio frequency input signal for energizing said coils with said audio signals;

7                 mounting the mirror and paid of coils relative to each other so that the  
8       mirror moves responsive to actuation of the coils with the input signal and causing the  
9       mirror to move to reflect the light beam in a different manner in accordance with the  
10      movement of the mirror to form a reflected beam directed generally towards the display  
11      surface to produce an image on the display surface;

12                 coupling the mirror with the coils so that the mirror moves responsive to  
13      audio signals input to said coils; and

14                 actuating the coils with the input audio signal so that the reflected beam  
15      traverses a path to produce an image on the display surface.

1           20. The method according to claim 19 wherein the coils are mounted on the  
2 rear non-reflecting surface of the mirror.